

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A pulley support double row ball bearing apparatus comprising:

an outer ring with an outer diameter of less than or equal to 65 mm and having a double row ~~outer ring~~ raceway on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~ raceway on an outer circumferential surface thereof;

a plurality of balls ~~each with a diameter of less than or equal to 4 mm in diameter, the balls being provided as several balls~~ retained by retainer portions so as to be free rolling between the ~~outer ring raceways and the inner raceways~~; and

~~a retainer which holds the balls so as to be free rolling; and~~

a seal ringring, disposed~~which exists~~ between the inner circumferential surface of the outer ring and the outer circumferential surface of the inner ring, to~~and~~ seals

off openings on both ends of an inner space accommodating the balls, and

wherein an axial ~~[[a]]~~ width of the ball bearing~~related to the axial direction~~ is less than or equal to 45% of an~~the~~ inner diameter of the inner ring, and by externally fitting the inner ring to a support member and internally fitting the outer ring to a pulley, the pulley is rotatably supported on a~~the~~ periphery of the support member, and~~wherein~~

wherein near both ends of the inner circumferential surface of the outer ring, chamfers are provided on ~~the~~ axially outside ends of continuous portions disposed~~that exists~~ between each of the outer ring raceways and a large diameter portions provided on both ends of the~~this~~ inner circumferential surface of the outer ring for stopingly engaging with a~~the~~ seal rings, each said~~there is~~ provided a chamfer having an axial length which is more than or equal to 30% of ~~more than~~ the axial length of the continuous portion, and tapering~~which tapers~~ in a direction of increasing inner diameter as it approaches~~ing~~ the large diameter portion.

2. (currently amended) A pulley support double row ball bearing apparatus comprising~~provided with~~:

an outer ring with an outer diameter of less than or equal to 65 mm and having a double row ~~outer ring~~ raceway on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~ raceway on an outer circumferential surface thereof;

a plurality of balls each with a diameter of less than or equal to 4 mm in diameter, ~~provided as several~~ the balls being retained by retainer portions so as to be free rolling between the ~~outer ring raceways and the inner~~ raceways;

~~a retainer which holds the balls so as to be free rolling; and~~

a seal ring~~ring~~, disposed~~which exists~~ between the inner circumferential surface of the outer ring and the outer circumferential surface of the inner ring, to~~and~~ seals off openings on both ends of an inner space accommodating the balls, and

wherein an axial [[a]] width of the ball bearing~~related to the axial direction~~ is less than or equal to 45% of an~~the~~ internal diameter of the inner ring, and by externally fitting the inner ring to a support member and internally fitting the outer ring to a pulley, the pulley is

rotatably supported on ~~at~~ the periphery of the support member,
wherein

~~with regard to the radial dimensions, each row of~~
the outer ~~ring~~ raceways is made radially shallower than each
row of the inner ~~ring~~ raceways.

3. (currently amended) A pulley support double row
ball bearing apparatus comprising~~provided with~~:

an outer ring with an outer diameter of less than
or equal to 65 mm and having a double row ~~outer ring~~ raceway
on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~
raceway on an outer circumferential surface thereof;

a plurality of balls each~~with a diameter of less~~
than or equal to 4 mm in diameter, ~~provided as several~~the
balls being retained by retainer portions so as to be free
rolling between the outer ~~ring~~ raceways and the inner
raceways;

~~a retainer which holds the balls so as to be free~~
~~rolling, and~~

a seal ring~~ring~~, disposed~~which exists~~ between the
inner circumferential surface of the outer ring and the
outer circumferential surface of the inner ring, to~~and~~ seals

off openings on both ends of an inner space accommodating the balls, and

wherein an axial width of the ball bearing related to the axial direction is less than or equal to 45% of the internal diameter of the inner ring, and by externally fitting the inner ring to a support member and internally fitting the outer ring to a pulley, the pulley is rotatably supported on the periphery of the support member, and

wherein each of the retainers is the retainer portions are designed such that inside surfaces of respective pockets are adjacent to and facing the rolling surfaces of each of the respective balls, and the radial positioning of the retainer portions is determined by the balls, wherein and a difference between a pitch diameter of a series of the balls and an inner diameter of the retainer is greater than a difference between an outer diameter of the retainer and the pitch diameter of the series of balls.

4. (currently amended) A pulley support double row ball bearing apparatus comprising~~provided with:~~

an outer ring with an outer diameter of less than or equal to 65 mm and having a double row ~~outer ring raceway~~ on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~
raceway on an outer circumferential surface thereof;

a plurality of balls each~~with a diameter of less~~
than or equal to 4 mm in diameter, ~~provided as several the~~
balls being retained by retainer portions so as to be free
rolling between the outer ~~ring raceways~~ and the inner
raceways;

~~a retainer which holds the balls so as to be free~~
rolling; and

~~a seal rings, disposed~~~~which exists~~ between the
inner circumferential surface of the outer ring and the
outer circumferential surface of the inner ring, to~~and~~ seals
off openings on both ends of an inner space accommodating
the balls, and

wherein an axial width of the ball bearing~~related~~
~~to the axial direction~~ is less than or equal to 45% of an~~the~~
internal diameter of the inner ring, and by externally
fitting the inner ring to a support member and internally
fitting the outer ring to a pulley, the pulley is rotatably
supported on ~~the~~a periphery of the support member, wherein

~~each of the retainers is~~ the retainer portions are
designed such that inside surfaces of respective pockets are
adjacent to and facing the rolling surfaces of ~~each of the~~
respective balls, and ~~the radial positioning of the retainer~~

portions is determined by the balls, and a difference between an inner diameter of the outer ring and an outer diameter of the each retainer portion is greater than a difference between an inner diameter of the each retainer portion and an outer diameter of the inner ring.

5. (currently amended) A pulley support double row ball bearing apparatus comprising~~provided with:~~

an outer ring with an outer diameter of less than or equal to 65 mm and having a double row ~~outer ring raceway~~ on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~ raceway on an outer circumferential surface thereof;

a plurality of balls ~~each with a diameter of less than or equal to 4 mm in diameter, provided as several the~~ balls being retained by retainer portions so as to be free rolling between the outer ~~ring raceways~~ and the inner raceways;

~~a retainer which holds the balls so as to be free rolling; and~~

~~a seal rings, disposed~~which exists between the inner circumferential surface of the outer ring and the outer circumferential surface of the inner ring, to and seals

off openings on both ends of an inner space accommodating the balls, and

wherein an axial width of the ball bearing related to the axial direction is less than or equal to 45% of ~~an~~ the internal diameter of the inner ring, and by externally fitting the inner ring to a support member and internally fitting the outer ring to a pulley, the pulley is rotatably supported on the periphery of the support member,

wherein a back-to-back duplex type contact angle is ~~provided forgiven to~~ each of the balls arranged in a double row, and an inner diameter of the outer ring on an axially outside portion, being an anti-loading side, of each row of the outer ring ~~raceways~~ raceway is greater than or equal to the largest diameter of each row of the outer ring ~~raceways~~ raceway.

6. (currently amended) A pulley support double row ball bearing apparatus comprising ~~provided with~~:

an outer ring with an outer diameter of less than or equal to 65 mm and having a double row ~~outer ring~~ raceway on an inner circumferential surface thereof;

an inner ring having a double row ~~inner ring~~ raceway on an outer circumferential surface thereof;

a plurality of balls each~~with a diameter of less than or equal to 4 mm in diameter, provided as several the balls each-being retained by retainer portions so as to be free rolling between the outer ring raceways and the inner raceways;~~

~~a retainer which holds the balls so as to be free rolling; and~~

a seal ring~~ring~~, disposed~~which exists~~ between the inner circumferential surface of the outer ring and the outer circumferential surface of the inner ring, to~~and~~ seals off openings on both ends of an inner space accommodating the balls, and

wherein an axial width of the ball bearing~~related to the axial direction~~ is less than or equal to 45% of the internal diameter of the inner ring, and by externally fitting the inner ring to a support member and internally fitting the outer ring to a pulley, the pulley is rotatably supported on the periphery of the support member, wherein

a face-to-face duplex type contact angle is provided~~for~~given to each of the balls arranged in a double row, and an inner diameter of the outer ring on an axially inside portion, being an anti-loading side, of each row of the outer ring ~~raceways-raceway~~ is greater than the largest diameter of each row of the outer ring ~~raceways-raceway~~.

7. (currently amended) A pulley support double row ball bearing apparatus according to claim 1, wherein at least one ~~member of~~ thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which ~~a~~the coefficient of linear expansion is greater than that of ~~a~~the metal material constituting eacha raceway ~~which is fitted to the member,~~ and a thickness related to the radial direction ~~of the raceway~~ at a portion corresponding to a bottom part of a raceway groove formed in eachthe raceway ~~fitted to the member is~~ ever greater than 50% of the diameter of ~~a~~the balls ~~of the ball bearing.~~

8. (currently amended) A pulley support double row ball bearing apparatus according to claim 2, wherein at least one member of thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which ~~a~~the coefficient of linear expansion is greater than that of ~~a~~the metal material constituting eacha raceway ~~which is fitted to the member,~~ and a thickness related to the radial direction ~~of the raceway~~ at a portion corresponding to a bottom part of a raceway groove formed in eachthe

raceway ~~fitted to the member~~ is greater than~~over~~ 50% of the diameter of a~~the~~ balls ~~of the ball bearing~~.

9. (currently amended) A pulley support double row ball bearing apparatus according to claim 3, wherein at least one member of thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which a~~the~~ coefficient of linear expansion is greater than that of a~~the~~ metal material constituting eacha raceway ~~which is fitted to the member~~, and a thickness related to the radial direction ~~of the raceway~~ at a portion corresponding to a bottom part of a raceway groove formed in each~~the~~ raceway ~~fitted to the member~~ is greater than~~over~~ 50% of the diameter of a~~the~~ balls ~~of the ball bearing~~.

10. (currently amended) A pulley support double row ball bearing apparatus according to claim 4, wherein at least one member of thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which a~~the~~ coefficient of linear expansion is greater than that of a~~the~~ metal material constituting eacha raceway ~~which is fitted to the member~~, and a thickness related to the

radial direction ~~of the raceway~~ at a portion corresponding to a bottom part of a raceway groove formed in each~~the~~ raceway ~~fitted to the member~~ is greater than~~ever~~ 50% of the diameter of a~~the~~ balls ~~of the ball bearing~~.

11. (currently amended) A pulley support double row ball bearing apparatus according to claim 5, wherein at least one member of thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which a~~the~~ coefficient of linear expansion is greater than that of a~~the~~ metal material constituting eacha raceway ~~which is fitted to the member~~, and a thickness related to the radial direction ~~of the raceway~~ at a portion corresponding to a bottom part of a raceway groove formed in each~~the~~ raceway ~~fitted to the member~~ is greater than~~ever~~ 50% of the diameter of a~~the~~ balls ~~of the ball bearing~~.

12. (currently amended) A pulley support double row ball bearing apparatus according to claim 6, wherein at least one member of thea pulley to which the outer ring is internally fitted, and thea support member to which the inner ring is externally fitted, is made from a material for which a~~the~~ coefficient of linear expansion is greater than

that of ~~the~~ metal material constituting each raceway ~~which~~
~~is fitted to the member,~~ and a thickness related to the
radial direction ~~of the raceway~~ at a portion corresponding
to a bottom part of a raceway groove formed in each ~~the~~
raceway ~~fitted to the member~~ is greater than ~~over~~ 50% of the
diameter of the ~~balls of the ball bearing.~~